DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0038
Facility Carried: SANTIAGO CNYN ROAD
Location : 0.2 MI W/O SILVERADO CYN
City :
Inspection Date : 05/06/2019

Bridge Inspection Report

Inspection Type

Routine	FC	Underwater	Special	Other
X				

STRUCTURE NAME: SANTIAGO CREEK

CONSTRUCTION INFORMATION

Year Built : 1963
Year Modified: N/A
Length (m) : 69.5

Skew (degrees): 0
No. of Joints : 2
No. of Hinges : 0

Structure Description: Continuous four span CIP/RC T-beam (5 each) with RC single column bents and RC open end seat abutments, all supported upon spread footings.

Span Configuration : (W) 49.00 feet, 2 @ 63.00 feet, 49.00 feet (E).

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: RF= 0.94 Calculation Method: (LRFR) LD & RES FACT RATING
Operating Rating: RF= 1.22 Calculation Method: (LRFR) LD & RES FACT RATING
Permit Rating : PPPPP
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 1.50 feet br, 27.50 feet, 1.50 feet br (N)
Total Width: 9.3 m Net Width: 8.5 m No. of Lanes: 2 Speed: 55 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 inches
Rail Code: 0111

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal with a cobbled bottom.

NOTICE

The bridge inspection condition assessment used for this inspection is based on the American Association of State Highway and Transportation Officials (AASHTO) Bridge Element Inspection Manual 2013 as defined in Moving Ahead for Progress in the 21st Century (MAP-21) federal law. The new element inspection methodology may result in changes to related condition and appraisal ratings on the bridge without significant physical changes at the bridge.

The element condition information contained in this report represents the current condition of the bridge based on the most recent routine and special inspections. Some of the notes presented below may be from an inspection that occurred prior to the date noted in this report. Refer to the Scope and Access section of this inspection report for a description of which portions of the bridge were inspected on this date.

INSPECTION COMMENTARY

WATERWAY
A channel cross section was taken on 03/28/2018; and also included with this report. The cross section was taken from the upstream side, and spot checked and compared the downstream side with the previous cross section taken on 10/27/2009. The results of that comparison indicated the channel was not significantly changed.

The channel was previously degraded and the embankment washed away at Bent #3. The city placed grouted riprap to protect it from scour.

INSPECTION COMMENTARY

The west channel slope is undermined about 4.0 feet long, 8.0 inches to 10.0 inches deep at the upstream side (southerly side).

SCOUR (HISTORY)
On 05/16/1995, Caltrans inspected the bridge and found embankment around Bent #3 (center pier) had completely
washed away, exposing the pedestal. Following receipt of the report, County forces placed riprap at Bent# 3 to
protect the column.

On 05/14/1996, Caltrans inspected the bridge and found that the streambed had again degraded due to scour at Bent
#3 (center pier) and that the footing was exposed. In response, County forces placed additional riprap and grouted
that placed immediately adjacent to the column.

06/05/2001, Caltrans inspected the bridge and found the top of the footing at Bent# 3 to be exposed. In response, County forces placed additional riprap and grouted that placed immediately adjacent to the column.

Hydraulic report dated on 10/27/2009:

This hydraulic report dated 10/27/2009 addresses hydraulic issues only. The structure's scour potential has been assessed in accordance with the FHWA Technical Advisory T5140.23, "Evaluating Scour at Bridges". The NBI Item 113 Code, "Vulnerability to Scour", has been changed to 5: "Bridge Foundations determined to be stable for assessed or calculated scour conditions. Scour is determined to be within the limits of footings or piles (Example B) by assessment (i.e., bridge foundations are on rock formations that have been determined to resist scour within the service life of the bridge), by calculations or by installation of properly designed countermeasures."

The local agency sent this office a set of scour mitigation as-built plans in the fall of 2009. At the request of the local agency, this office performed a field review on 10-27-2009.

On the date of the investigation, the channel was dry. A downstream cross section was taken (attached). Comparison of this cross section to historical cross sections indicate that the channel has been modified and this was verified in the field.

Although the channel bed appears lower then what is showed on the original as-built plans,the channel modifications are visible and furthermore, the channel modifications appear to provide adequate scour protection against scour.

Scour mitigation plans indicate that new footing skirts were placed at Piers 2, 3 and 4 and new rock placed at Piers 2 and 3.

Large rock protection was noted along the westerly embankment and appears to provide adequate protections for Abutment 1 and Pier 2. No foundation exposure was noted.

The thalweg was noted in the middle of Span 2. It appears to be well aligned to the bridge opening. The channel consisted of silty sand and gravel with some rock outcrops visible within the channel.

Pier 3 was protected by an apron of grouted rock and a new footing skirt. The top of the new footing skirt was exposed. The scour countermeasures at Pier 3 appeared adequate and in correspondence with the local agency, the new footing skirt apparently was placed to a competent hard sandstone. Upon visual inspection of the sandstone outcrops visible in the channel both upstream and downstream of the bridge, the sandstone in the area appears

INSPECTION COMMENTARY

to be hard and competent material that will likely provide a scour resistant foundation base for Pier 3.

No other scour or scour potential was noted. Based upon what was noted in the field and the information provided by the local agency, the bridge is no longer considered scour critical.

A request #7983 was sent to the hydraulic department on 03/05/2018 to re-assess the current hydraulic condition.

SCOPE AND ACCESS
A complete routine inspection was performed by walking on and around the structure to inspect all visible elements on the existing structures. The creek was dry at the time of the inspection. A full visual inspection is performed for the visible substructure elements. Pedestrian access is from northeast and southwest quadrants.

DECK AND ROADWAY
The bridge deck cracks has been treated with Methacrylate.

The AC roadway is at both of approach and departure lanes with a (2.0 feet L X 1.0 foot W X 2.0 inches D) pothole at the easterly abutment.

There are several hairline transverse cracks at (0.04 inches wide, average 2.0 long) with efflorescence on deck soffit and under both deck overhangs.

SUPERSTRUCTURE
The bottom face of the north girder has a spall at (24.0 inches L X 4.0 inches W X 1.0 inch D) about 25.0 feet from column #3, Span 3 (see the attached photo no. 6).

The concrete girders have few vertical and diagonal cracks, up to 2.5 feet long and up to 0.04 inches wide mainly near the supports.

SUBSTRUCTURE
The westerly abutment has a vertical crack at 0.05 inches wide under girder #3.

SAFE LOAD CAPACITY
A Load Rating Summary Sheet is achieved on 11/28/2017 for this structure. The current rating has been assigned in accordance with SM & I procedures for this structure. Based on the field conditions and load history, the structure is adequate to carry legal loads.

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each Condition State St. 1	St. 2	St. 3	St. 4
16			Top Flange-RC	2	646	sq.m	616	30	0	0
	1120		Efflorescence/Rust Staining	2	10		0	10	0	0
	1130		Cracking (RC and Other)	2	20		0	20	0	0
	521		Concrete Coat.(Meth/Paint/Seal)	2	584	sq.m	584	0	0	0

(16)
There were no significant defects noted.

(16-1120)

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each Condition State St. 1	St. 2	St. 3	St. 4

There are several hairline transverse cracks at (0.04 inches wide, average 2.0 long) with efflorescence on deck soffit and under both deck overhangs.

(16-1130)
There are several hairline transverse cracks at (0.04 inches wide, average 2.0 long) with efflorescence on deck soffit and under both deck overhangs.

(16-521)
There were no significant defects noted.

110		**Girder/Beam-RC**	2	348	m	332	15	1	0
	1080	**Delamination/Spall/Patched Area**	2	1		0	0	1	0
	1130	**Cracking (RC and Other)**	2	15		0	15	0	0

(110)
Spalls and cracks.

(110-1080)
The bottom face of the north girder has a spall at (24.0 inches L X 4.0 inches W X 1.0 inch D) about 25.0 feet from column #3, Span 3 (see the attached photo no. 6).

(110-1130)
The concrete girders have few vertical and diagonal cracks, up to 2.5 feet long and up to 0.04 inches wide mainly near the supports.

215		**Abutment-RC**	2	28	m	27	1	0	0
	1130	**Cracking (RC and Other)**	2	1		0	1	0	0

(215)
There were no significant defects noted.

(215-1130)
The westerly abutment has a vertical crack, 0.05 inches wide under girder #3.

220		**Pile Cap/Footing-RC**	2	12	m	0	12	0	0
	6000	**Scour**	2	12		0	12	0	0

(220-6000)
The following is the locations of spread footing with scour issues at columns:

The footing under column #2 is exposed about 20.0 feet long and 30.0 inches deep, there are rocks around the footing (see the attached photo no. 3)

The footing under column #3 is exposed about 20.0 feet long and 18.0 inches deep; however there is a grouted riprap around the footing. In addition, there is an undermining at 15.0 inches at the upstream side, southerly side (see the attached photo no. 2).

234		**Pier Cap-RC**	2	27	m	27	0	0	0

(234)
There were no significant defects noted.

254		**Column Shell-Full Ht**	2	3	ea.	3	0	0	0

(254)
The footings top are exposed 2' x 10' at bent #2 and #3. According to the hydraulic report it is within the limits

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each Condition State St. 1	St. 2	St. 3	St. 4
256			Slope Protection	2	2	ea.	2	0	0	0
(256) There were no significant defects noted.										
301			Joint-Pourable Seal	2	20	m	20	0	0	0
(301) There were no significant defects noted.										
311			Bearing-Moveable	2	10	each	10	0	0	0
(311) There were no significant defects noted.										
330			Railing-Metal	2	139	m	139	0	0	0
(330) There were no significant defects noted.										

WORK RECOMMENDATIONS

RecDate: 09/07/2017
Action : Scour-Place Counterm
Work By: LOCAL AGENCY
Status : PROPOSED

EstCost:
StrTarget: 2 YEARS
DistTarget:
EA:

Protect the channel bed and sides, around the columns from further degradation and scour.

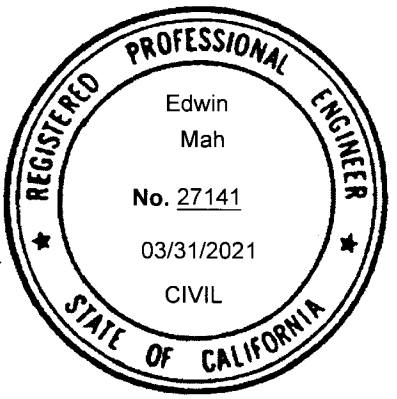
Team Leader : Edwin Mah

Report Author : Nelson N. Vo

Inspected By : NN.Vo/E.Mah

8/22/2019

Edwin Mah (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

********** IDENTIFICATION **********

(1) STATE NAME- CALIFORNIA 069
(8) STRUCTURE NUMBER **55C0038**
(5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
(2) HIGHWAY AGENCY DISTRICT 12
(3) COUNTY CODE 059 (4) PLACE CODE 00000
(6) FEATURE INTERSECTED- SANTIAGO CREEK
(7) FACILITY CARRIED- SANTIAGO CNYN ROAD
(9) LOCATION- 0.2 MI W/O SILVERADO CYN
(11) MILEPOINT/KILOMETERPOINT 0
(12) BASE HIGHWAY NETWORK- PART OF NET 1
(13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
(16) LATITUDE 33 DEG 44 MIN 51.58 SEC
(17) LONGITUDE 117 DEG 40 MIN 33.96 SEC
(98) BORDER BRIDGE STATE CODE % SHARE %
(99) BORDER BRIDGE STRUCTURE NUMBER

******** STRUCTURE TYPE AND MATERIAL *********

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE CONT
TYPE- TEE BEAM CODE 204
(44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
TYPE- OTHER/NA CODE 000
(45) NUMBER OF SPANS IN MAIN UNIT 4
(46) NUMBER OF APPROACH SPANS 0
(107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
(108) WEARING SURFACE / PROTECTIVE SYSTEM:
A) TYPE OF WEARING SURFACE- NONE CODE 0
B) TYPE OF MEMBRANE- NONE CODE 0
C) TYPE OF DECK PROTECTION- NONE CODE 0

********** AGE AND SERVICE **********

(27) YEAR BUILT 1963
(106) YEAR RECONSTRUCTED 0000
(42) TYPE OF SERVICE: ON- HIGHWAY 1
UNDER- WATERWAY 5
(28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
(29) AVERAGE DAILY TRAFFIC 7000
(30) YEAR OF ADT 2019 (109) TRUCK ADT 5 %
(19) BYPASS, DETOUR LENGTH 22 KM

********** GEOMETRIC DATA **********

(48) LENGTH OF MAXIMUM SPAN 19.2 M
(49) STRUCTURE LENGTH 69.5 M
(50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
(51) BRIDGE ROADWAY WIDTH CURB TO CURB 8.5 M
(52) DECK WIDTH OUT TO OUT 9.3 M
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 12.2 M
(33) BRIDGE MEDIAN- NO MEDIAN 0
(34) SKEW 0 DEG (35) STRUCTURE FLARED NO
(10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR 8.5 M
(53) MIN VERT CLEAR OVER BRIDGE RDWY 99.99 M
(54) MIN VERT UNDERCLEAR REF- NOT H/RR 0.00 M
(55) MIN LAT UNDERCLEAR RT REF- NOT H/RR 0.0 M
(56) MIN LAT UNDERCLEAR LT 0.0 M

********** NAVIGATION DATA **********

(38) NAVIGATION CONTROL- NOT APPLICABLE CODE N
(111) PIER PROTECTION- CODE
(39) NAVIGATION VERTICAL CLEARANCE 0.0 M
(116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR M
(40) NAVIGATION HORIZONTAL CLEARANCE 0.0 M

****

SUFFICIENCY RATING = 73.0

PAINT CONDITION INDEX = N/A

********** CLASSIFICATION ********** CODE

(112) NBIS BRIDGE LENGTH- YES Y
(104) HIGHWAY SYSTEM- ROUTE ON NHS 1
(26) FUNCTIONAL CLASS- OTHER PRIN ART URBAN 14
(100) DEFENSE HIGHWAY- NOT STRAHNET 0
(101) PARALLEL STRUCTURE- NONE EXISTS N
(102) DIRECTION OF TRAFFIC- 2 WAY 2
(103) TEMPORARY STRUCTURE-
(105) FED.LANDS HWY- NOT APPLICABLE 0
(110) DESIGNATED NATIONAL NETWORK - NOT ON NET 0
(20) TOLL- ON FREE ROAD 3
(21) MAINTAIN- COUNTY HIGHWAY AGENCY 02
(22) OWNER- COUNTY HIGHWAY AGENCY 02
(37) HISTORICAL SIGNIFICANCE- NOT ELIGIBLE 5

********** CONDITION ********** CODE

(58) DECK 7
(59) SUPERSTRUCTURE 7
(60) SUBSTRUCTURE 7
(61) CHANNEL & CHANNEL PROTECTION 4
(62) CULVERTS N

********* LOAD RATING AND POSTING ********* CODE

(31) DESIGN LOAD- MS-18 OR HS-20 5
(63) OPERATING RATING METHOD- (LRFR) LD & RES FA 8
(64) OPERATING RATING- RF= 1.22
(65) INVENTORY RATING METHOD- (LRFR) LD & RES FA 8
(66) INVENTORY RATING- RF= 0.94
(70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
(41) STRUCTURE OPEN, POSTED OR CLOSED- A
DESCRIPTION- OPEN, NO RESTRICTION

********** APPRAISAL ********** CODE

(67) STRUCTURAL EVALUATION 7
(68) DECK GEOMETRY 4
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
(71) WATER ADEQUACY 8
(72) APPROACH ROADWAY ALIGNMENT 6
(36) TRAFFIC SAFETY FEATURES 0111
(113) SCOUR CRITICAL BRIDGES 5

********** PROPOSED IMPROVEMENTS **********

(75) TYPE OF WORK- CODE
(76) LENGTH OF STRUCTURE IMPROVEMENT M
(94) BRIDGE IMPROVEMENT COST
(95) ROADWAY IMPROVEMENT COST
(96) TOTAL PROJECT COST
(97) YEAR OF IMPROVEMENT COST ESTIMATE
(114) FUTURE ADT 9619
(115) YEAR OF FUTURE ADT 2037

********** INSPECTIONS **********

(90) INSPECTION DATE 05/19 (91) FREQUENCY 24 MO
(92) CRITICAL FEATURE INSPECTION: (93) CFI DATE
A) FRACTURE CRIT DETAIL- NO MO A)
B) UNDERWATER INSP- NO MO B)
C) OTHER SPECIAL INSP- NO MO C)

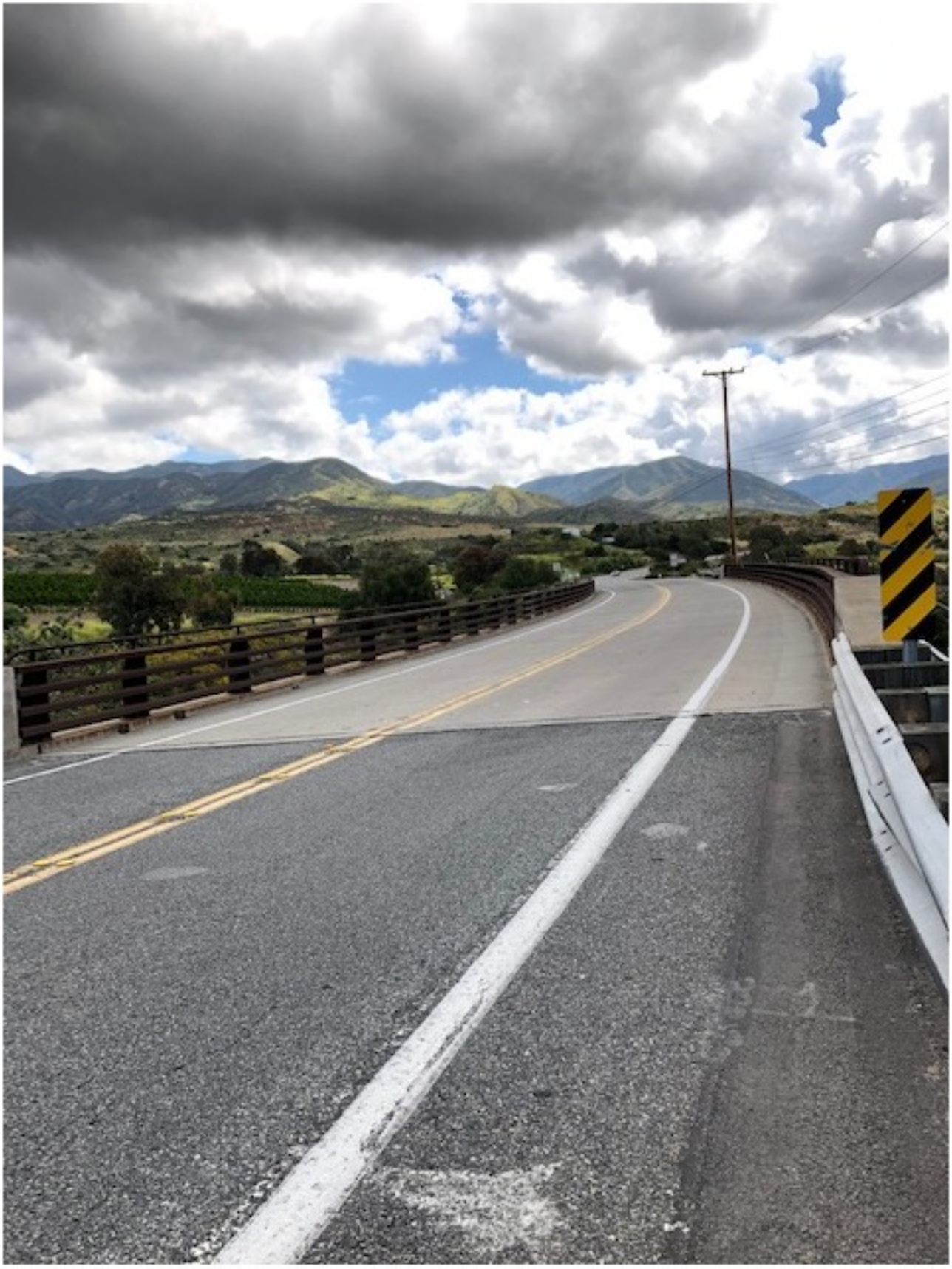


Photo No. 1
Deckview looking east

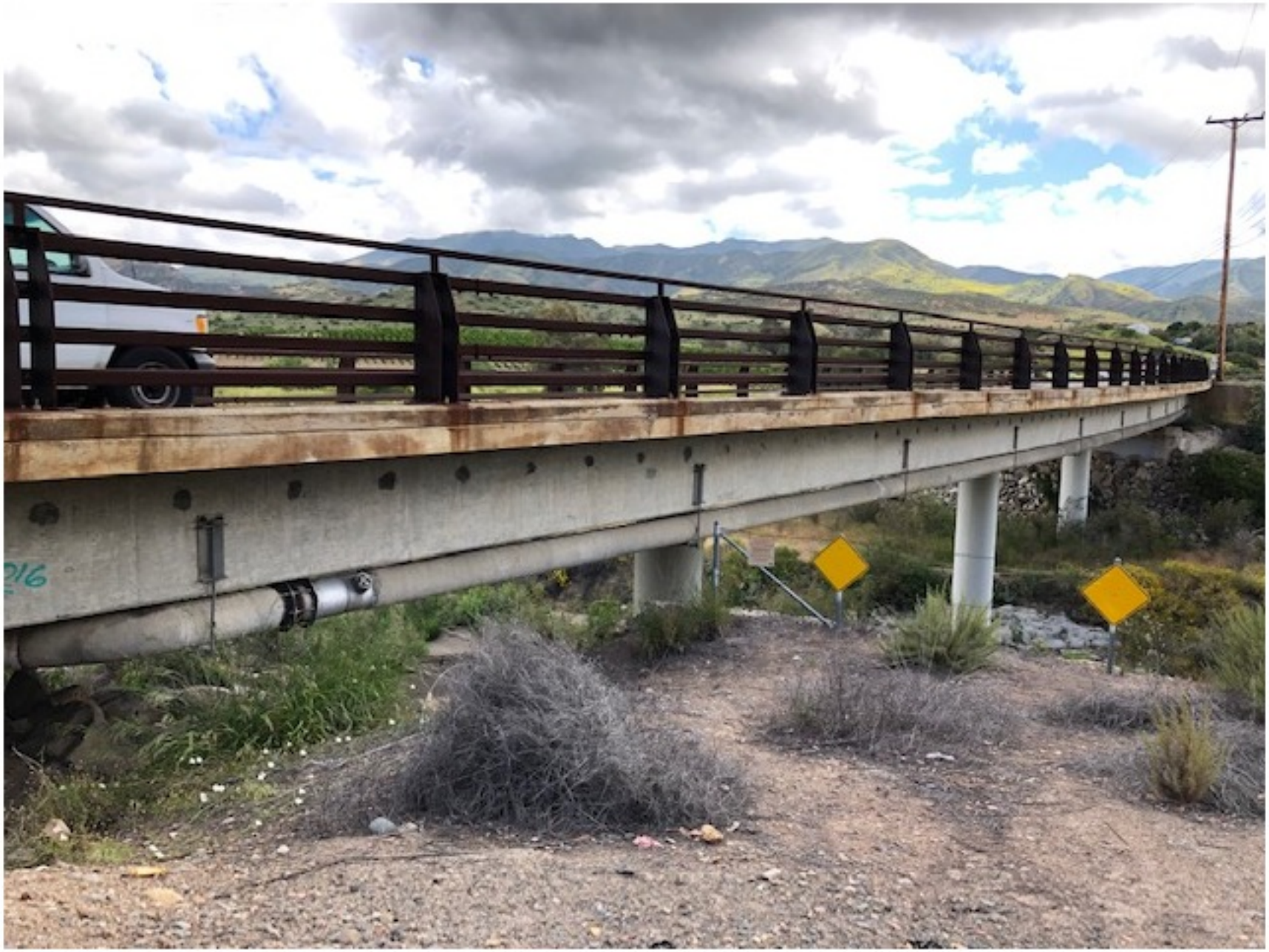


Photo No. 1
Elevation looking northeast, southerly rail

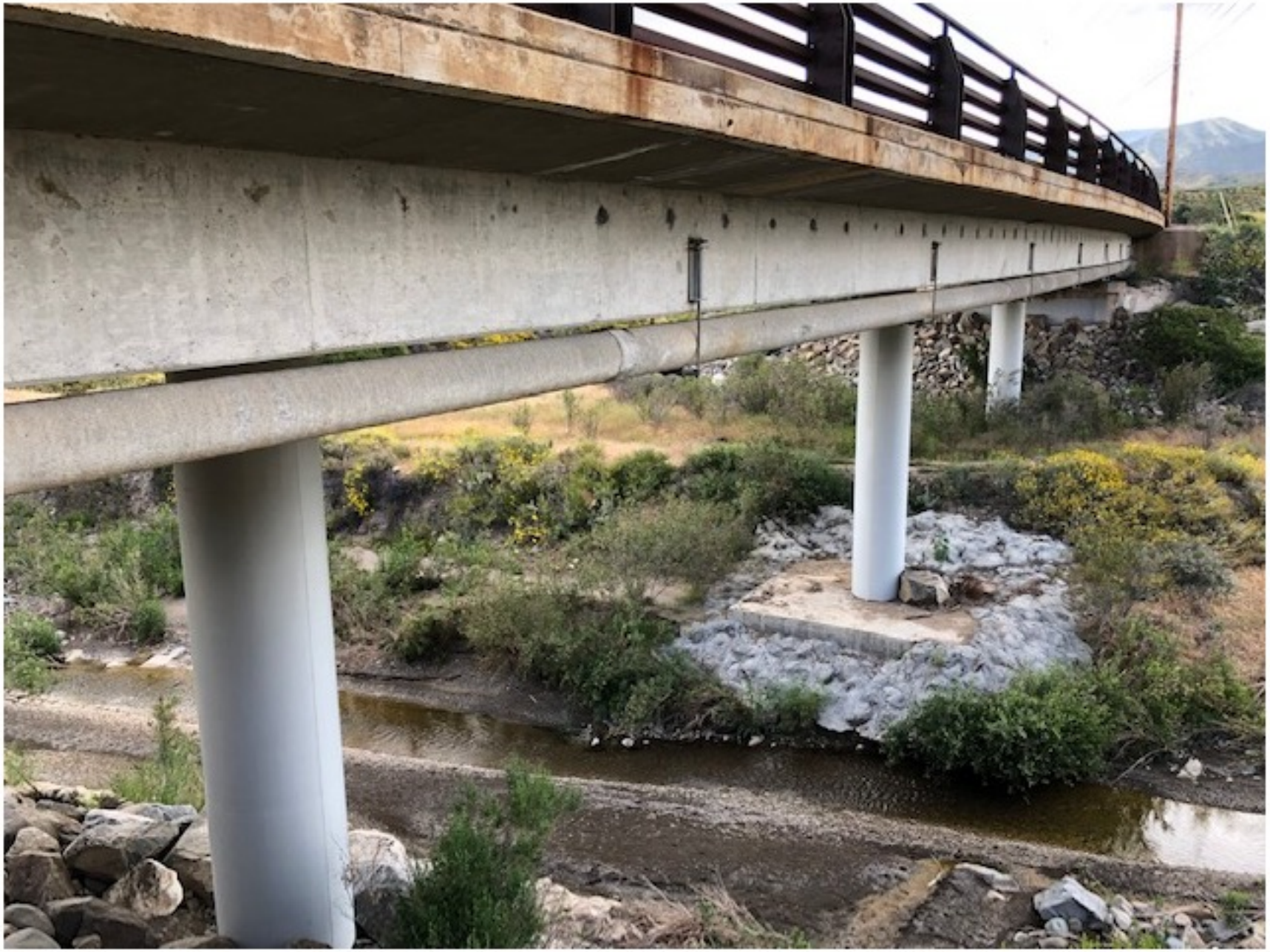
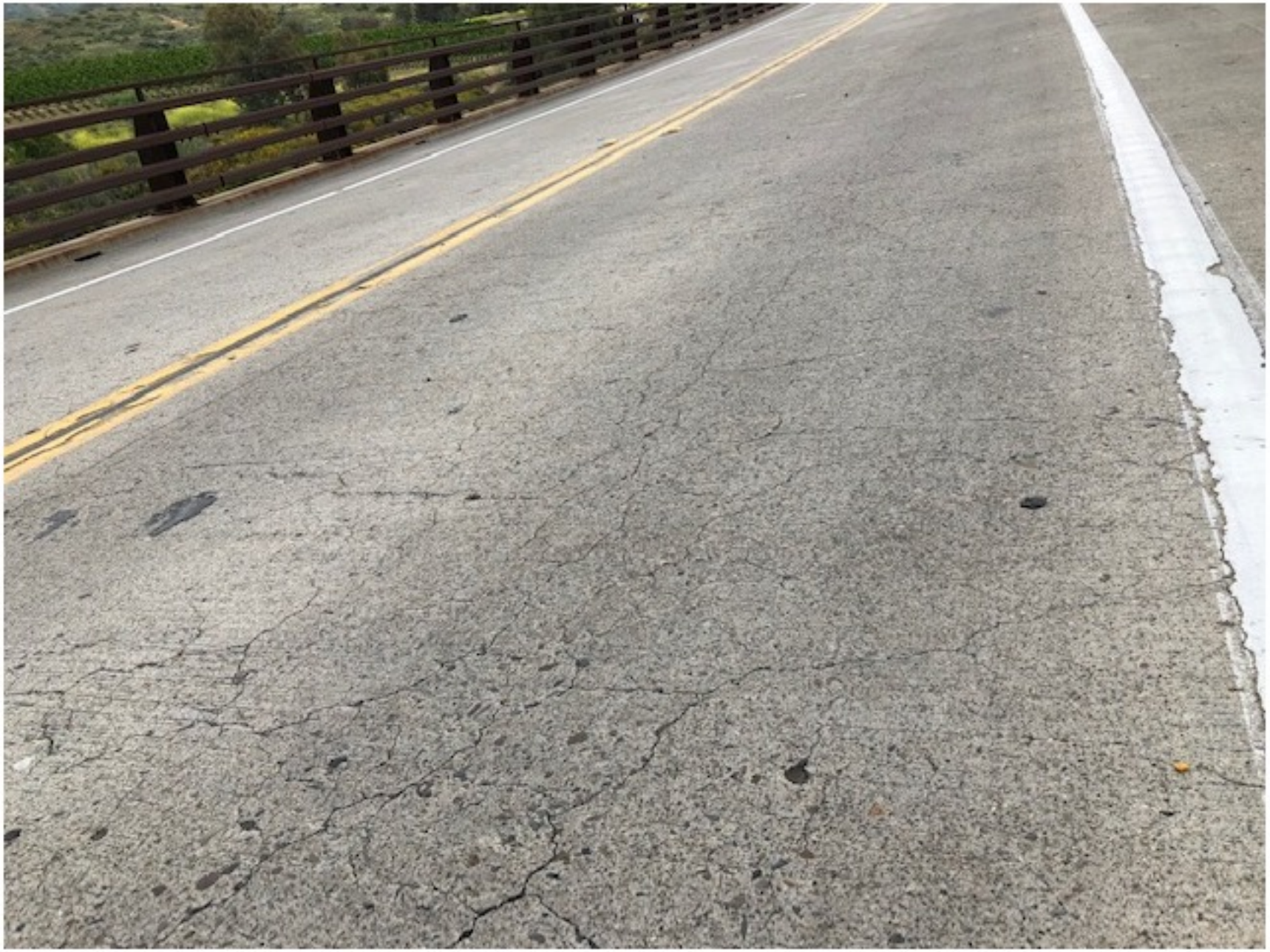


Photo No. 1
Elevation shows superstructure, substructure elements and upstream/downstream.



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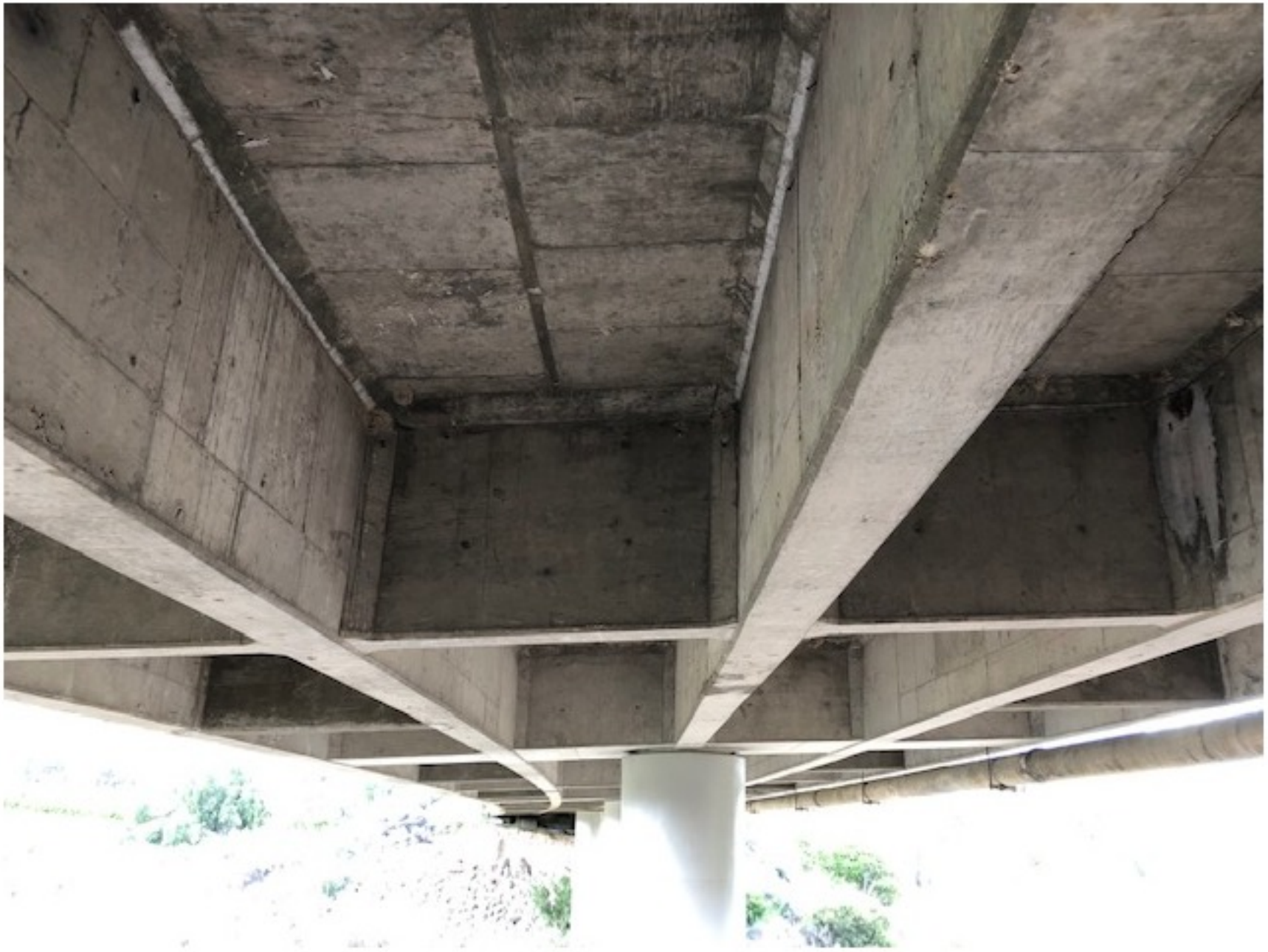

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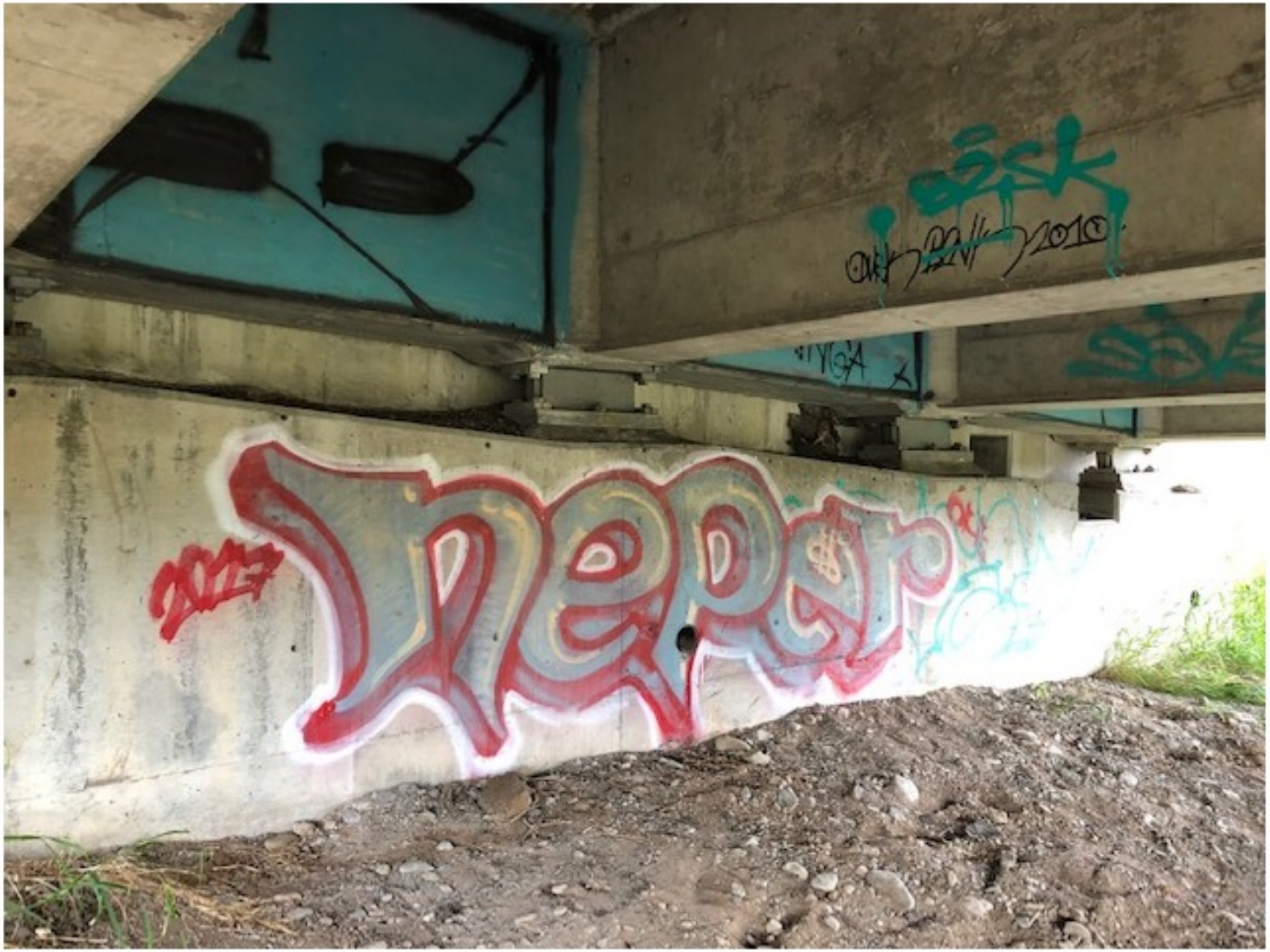


Photo No. 1
Westerly Abutment

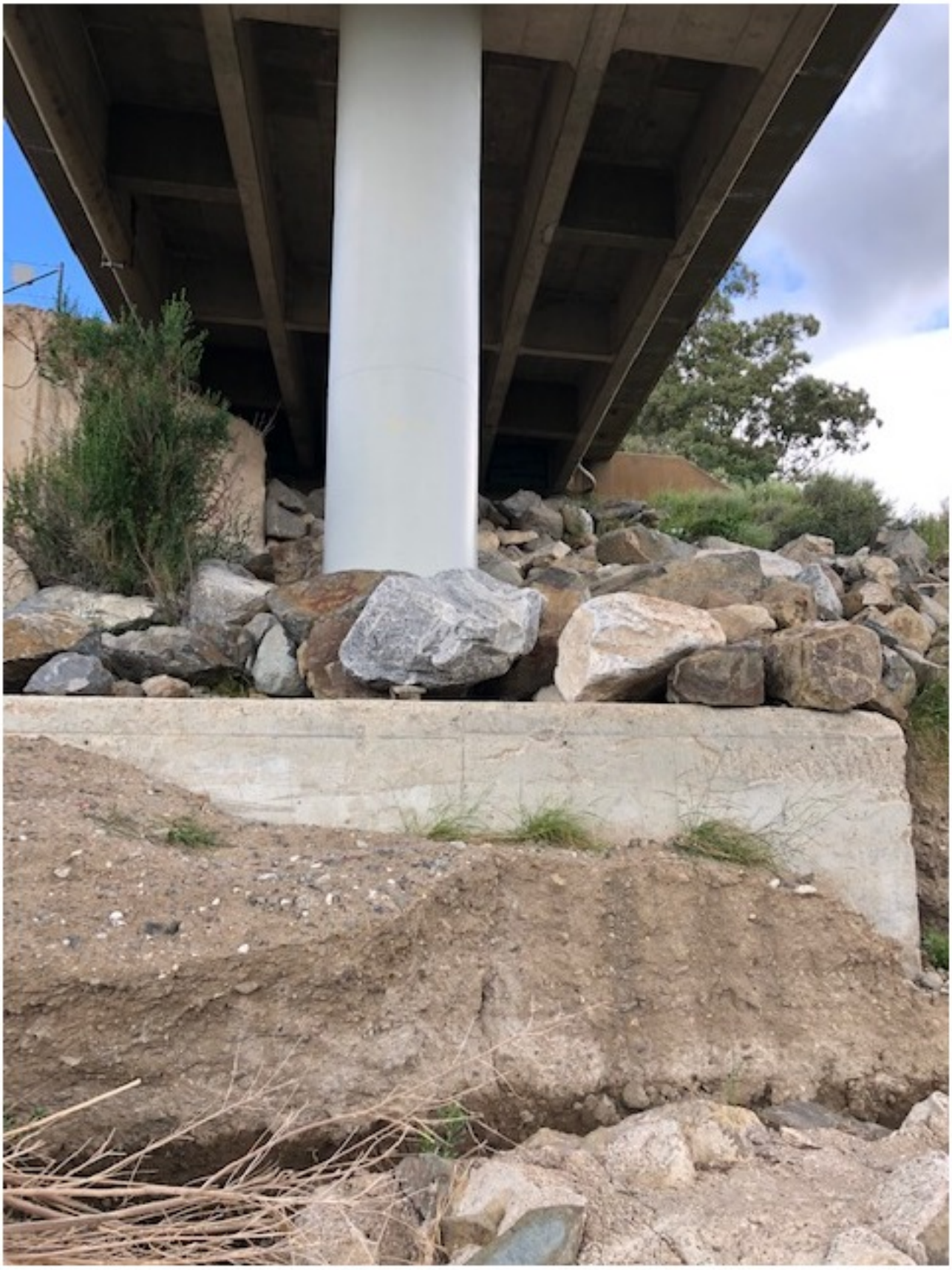


Photo No. 1
Bent #2 with a minor washout due to recent rain

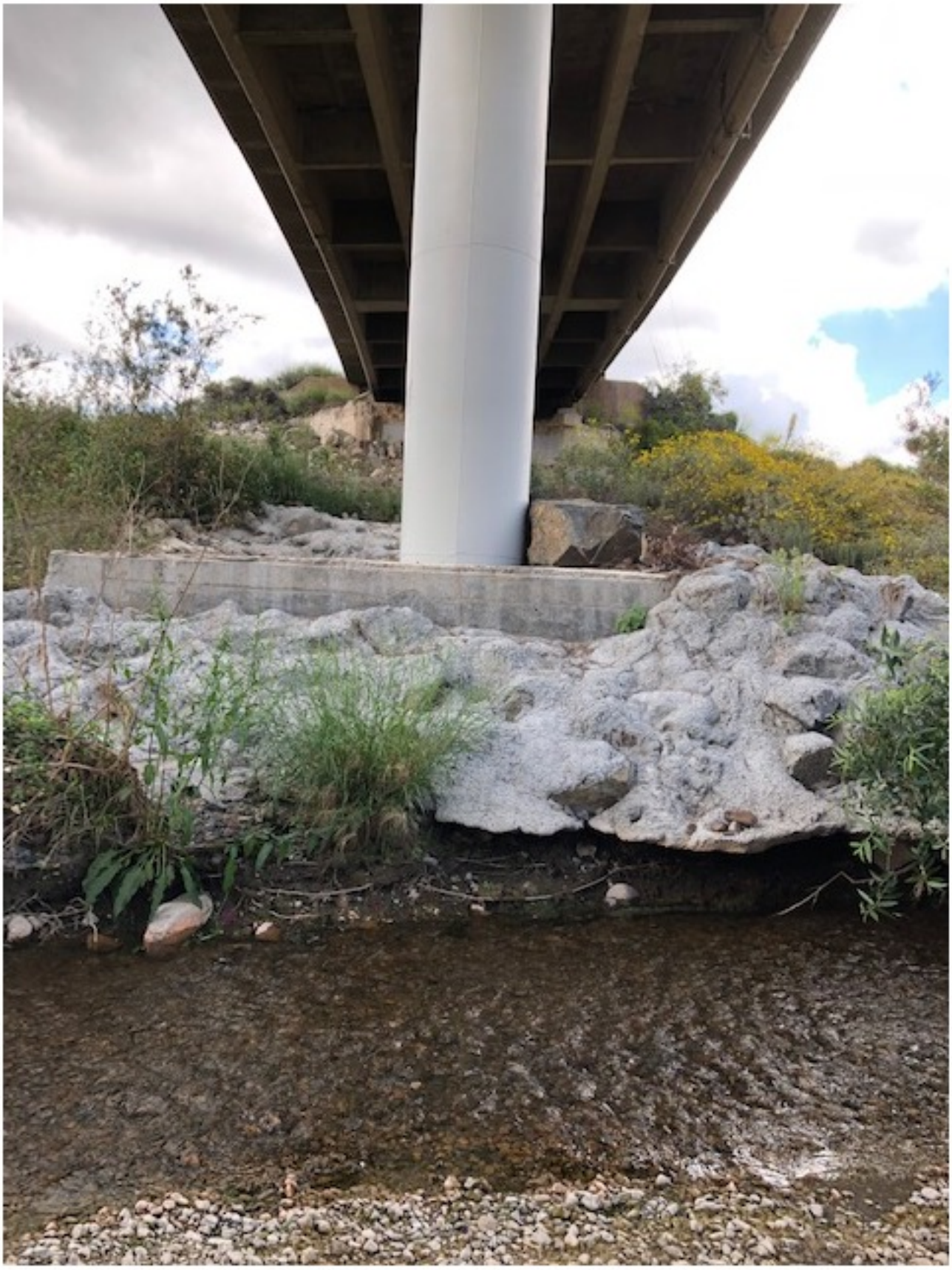
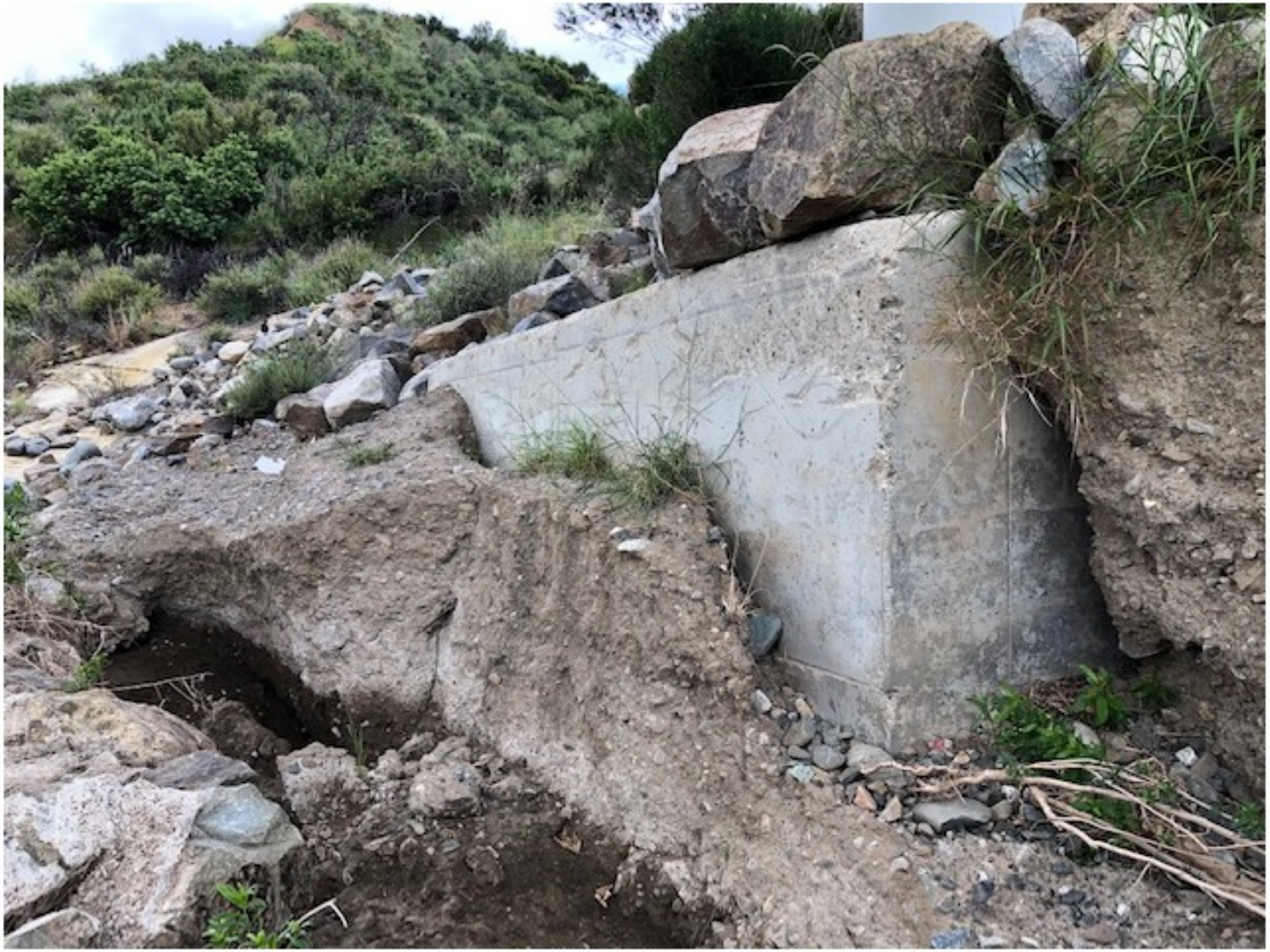


Photo No. 1
Bent #3, footing is protected by concrete apron but it has a minor washout in BIR.



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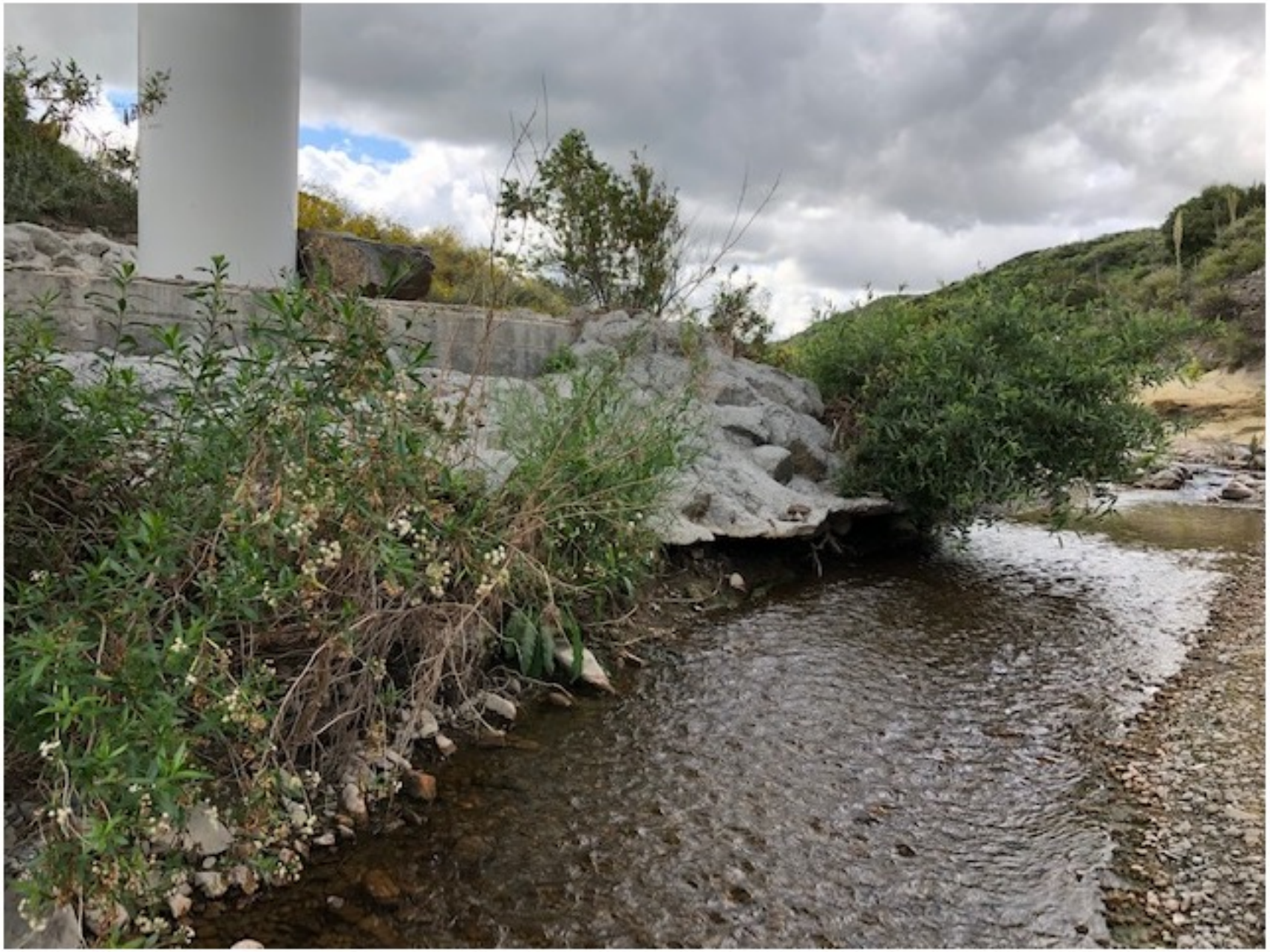


Photo No. 1
Looking Upstream (South) at the Bent #3 with a minor washout that has been noticed in BIR

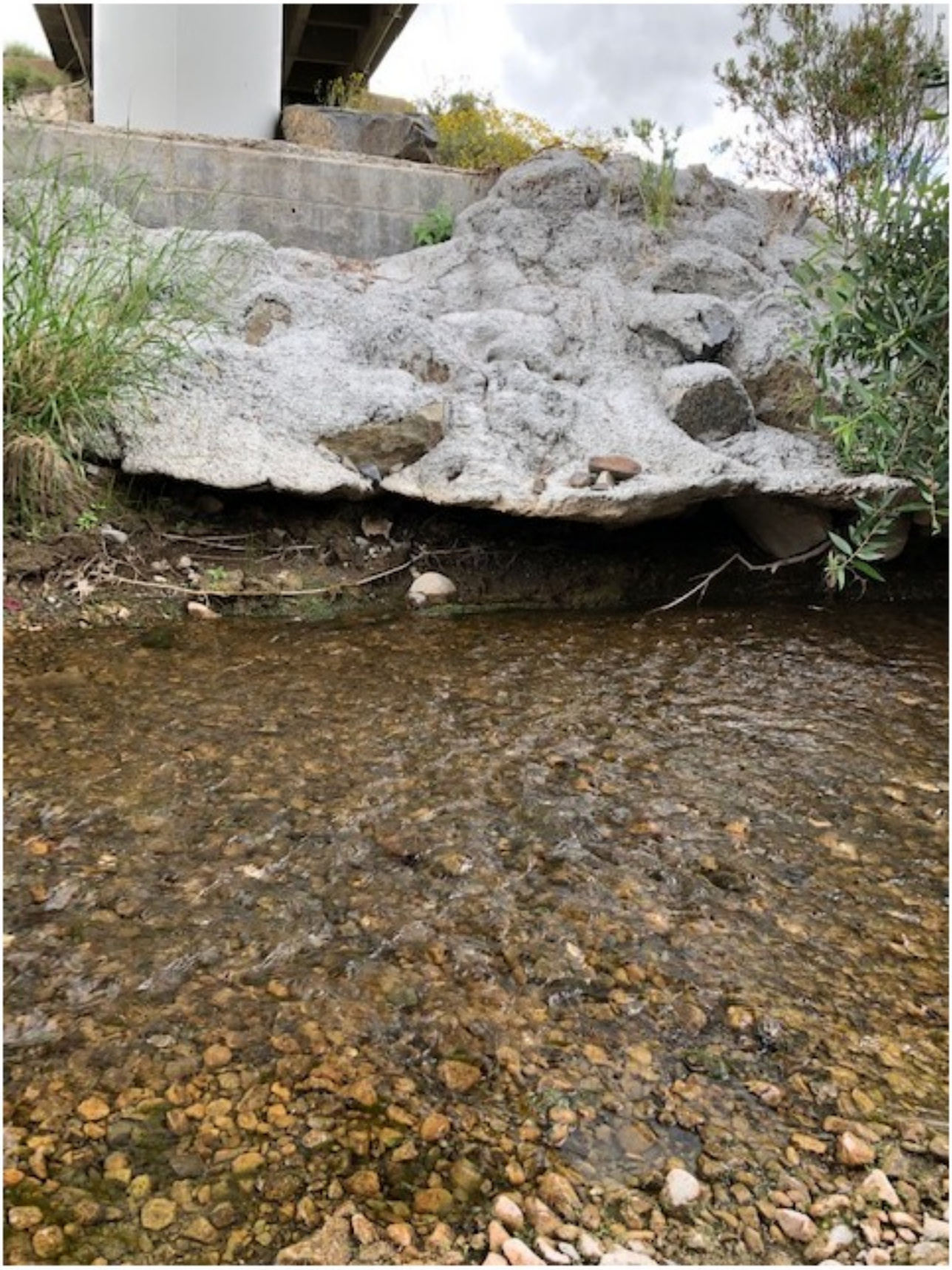


Photo No. 1
Bent #3, looking southeast

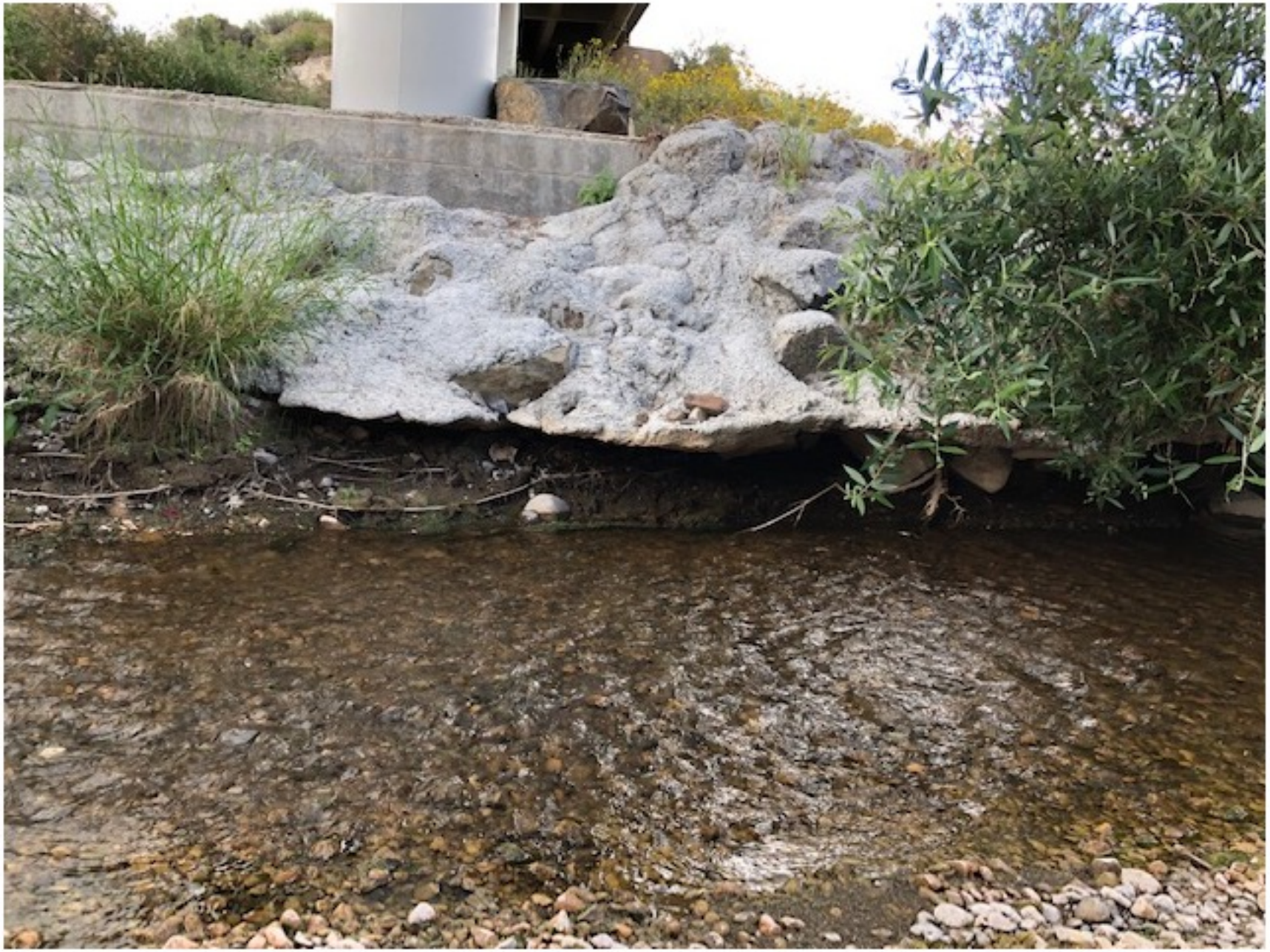
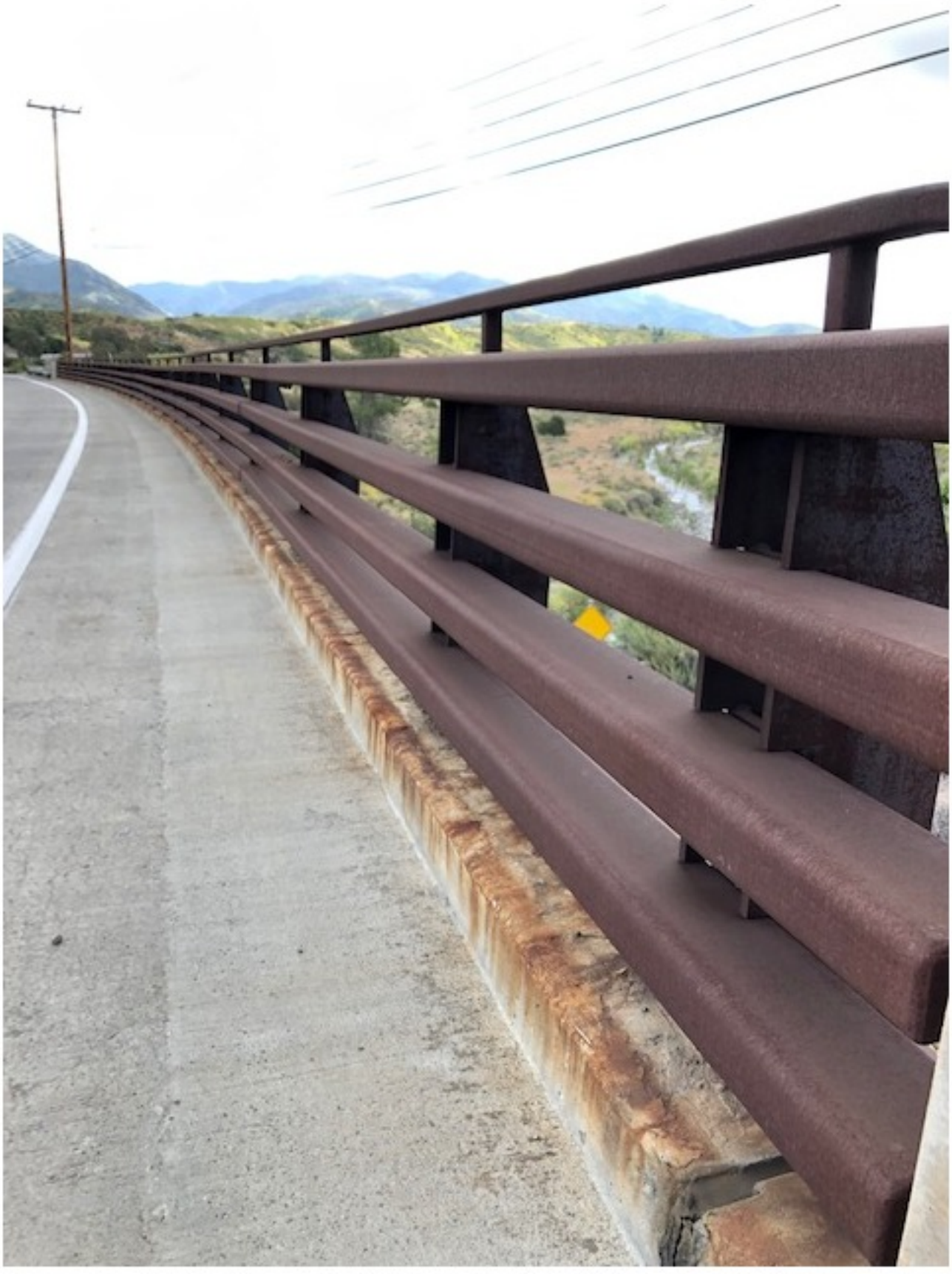


Photo No. 1
Bent #3, footing is protected by concrete apron but it has a minor washout in BIR.



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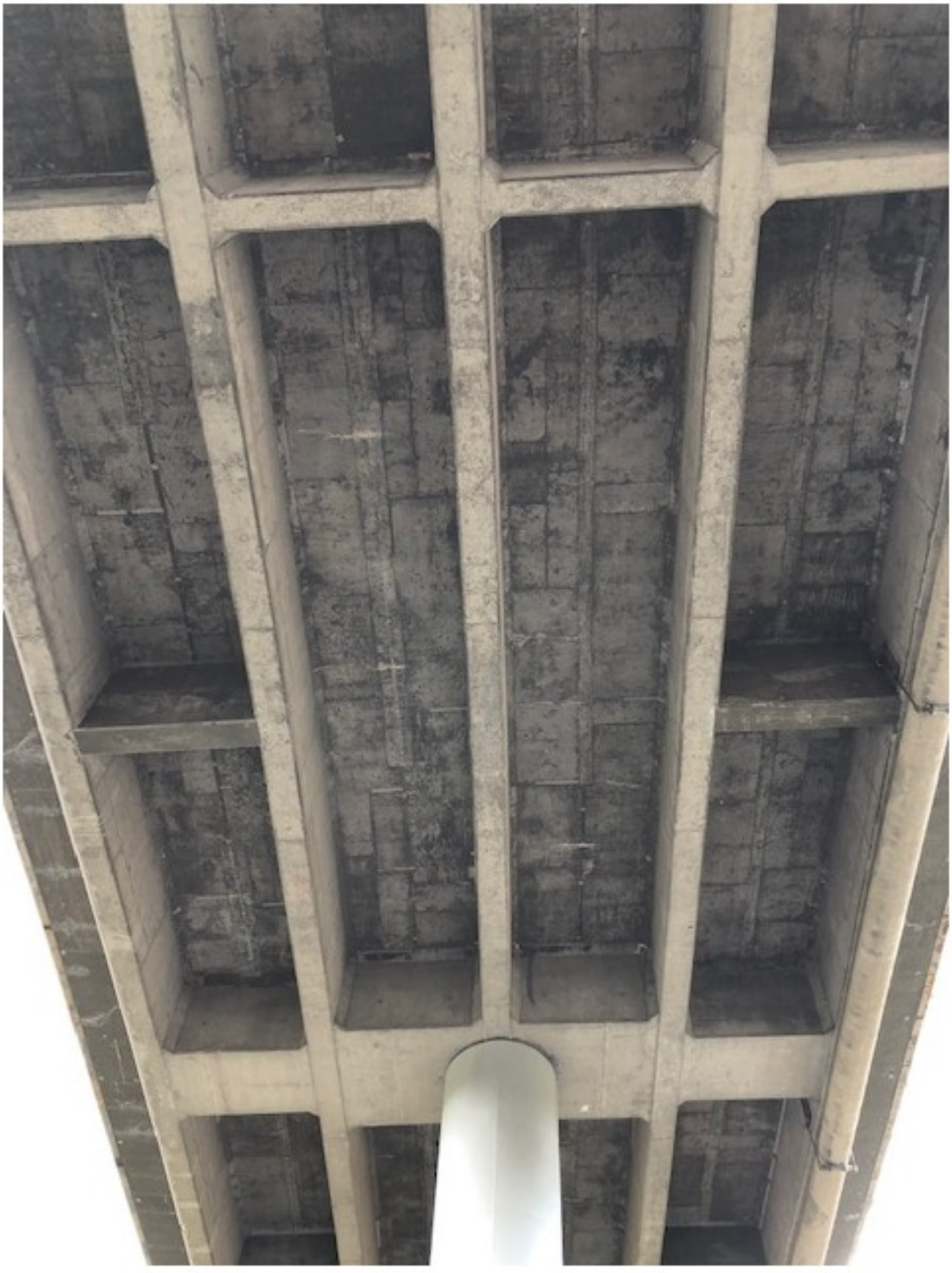

Photo No. 1